PTO/SB/17 (12-04v2)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	09/930,990-Conf. #8682
Filing Date	August 17, 2001
First Named Inventor	Wen-Shi HUANG
Examiner Name	N. B. Patel
Art Unit	3743
Attorney Docket No.	0941-1282PUS1

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☐ Deposit Account Deposit Account Number: 02-2448 Deposit Account Name: Birch, Stewart, Kolasch & Birch, LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
_____	- 20 =	_____	x _____	=	_____

Multiple Dependent Claims

Fee ($)	**Fee Paid ($)**

Indep. Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
_____	- 3 =	_____	x _____	=	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

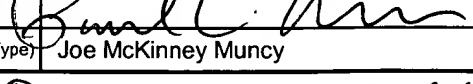
Total Sheets		**Extra Sheets**		**Number of each additional 50 or fraction thereof**	**Fee ($)**	**Fee Paid ($)**
_____	- 100 =	_____	/50	_____ (round up to a whole number) x	_____	= _____

4. OTHER FEE(S) **Fees Paid ($)**

Non-English Specification, $130 fee (no small entity discount)

Other (e.g., late filing surcharge): 1402 Filing a brief in support of an appeal 500.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	32,334	Telephone	(703) 205-8000
Name (Print/Type)	Joe McKinney Muncy			Date	March 24, 2006

for #43,368

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Wen-Shi HUANG et al.

Application No.: 09/930,990 Confirmation No.: 8682

Filed: August 17, 2001 Art Unit: 3743

For: EMBEDDED CENTRIFUGAL COOLING DEVICE Examiner: N. B. Patel

APPEAL BRIEF TRANSMITTAL FORM

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 24, 2006

Sir:

Transmitted herewith is an Appeal Brief on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on January 25, 2006.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27.

The fee has been calculated as shown below:

☐ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - $0.

Application No.: 09/930,990 Docket No.: 0941-1282PUS1

☒ Fee for filing an Appeal Brief - $500.00 (large entity).

☒ Check(s) in the amount of $500 is attached.

☐ Please charge Deposit Account No. 02-2448 in the amount of $0. A triplicate copy of this sheet is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: March 24, 2006

Respectfully submitted,

By _____

Joe McKinney Muncy
Registration No.: 32,334 #43,368
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant

Attachment(s)

Docket No.: 0941-1282PUS1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Wen-Shi HUANG et al.

Application No.: 09/930,990 Confirmation No.: 8682

Filed: August 17, 2001 Art Unit: 3743

For: EMBEDDED CENTRIFUGAL COOLING DEVICE Examiner: N. B. Patel

APPEAL BRIEF

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 24, 2006

Sir:

As required under § 41.37(a), this brief is filed no more than two months after the Notice of Appeal filed in this case on January 25, 2006, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

I. Real Party In Interest
II Related Appeals and Interferences
III. Status of Claims
IV. Status of Amendments
V. Summary of Claimed Subject Matter
VI. Grounds of Rejection to be Reviewed on Appeal

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

DELTA ELECTRONICS, INC. of Taiwan by virtue of the Assignment recorded at Reel 012330/Frame 0854.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 17 claims pending in application.

B. Current Status of Claims

1. Claims canceled: 1-7

2. Claims withdrawn from consideration but not canceled: None

3. Claims pending: 8-24

4. Claims allowed: None

5. Claims rejected: 8-24

C. Claims On Appeal

The claims on appeal are claims 8-24

IV. STATUS OF AMENDMENTS

Applicant did not file an Amendment After Final Rejection. However, an Amendment is enclosed to correct the dependency of claim 10 so that antecedent basis is properly provided for "said cover" in line 2 of claim 10 and to correct a problem of antecedent basis in claim 24.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In general, the present invention relates to a centrifugal fan for cooling a heat sink attached to an electronic device such as a CPU. The heat sink 100 (Fig. 2(a)) includes various fins in an array. An annular cavity 120 has no fins and corresponds in size and location to the blades 220 of the fan. Thus, this cavity allows the fan blades 220 to extend downwardly between the fins (Fig. 3). The array of fins includes fins 110 which are outside the cavity and fins 130 which are inside the cavity. Some of the fins 130 are of full height whereas some of the fins 131, which are below the hub 230, are of reduced height. There is a space between the hub 230 including the rotary shaft 210 and the fins 131. A cover 300 is placed over the heat sink and includes holes 310 for incoming air to passthrough.

Claim 8 is an independent claim which describes the centrifugal fan including a rotary shaft 210 and a plurality of blades 220 (Fig. 2(a)). A heat sink 100 includes a plurality of first cooling fins 110 and a plurality of second cooling fins 130 wherein an annular cavity 120 is defined between the first and second cooling fins. The second cooling fins include a lower portion 131. The blades 220 are located in the cavity 120 and there is a distance (unnumbered but seen in Fig. 3) between the rotary shaft 210 and the second cooling pins 131 so that the rotary shaft is located above the fins 131 and the shaft is positioned away from the fins 131.

A second independent claim 14 describes the heat sink 100 including a plurality of first cooling fins 110 and a plurality of second cooling fins 130 wherein a cavity 120 is defined between the first and second cooling fins and the second cooling fins include a lower portion 131. A cover 300 is connected to heat sink 100 and has corners directly contacted to fins 110 (see Fig. 2(a) where the corners of cover 300 have small holes which align with holes in the corner fins of the heat sink). A centrifugal fan 200 includes a rotary shaft 210, a plurality of blades 220 with the blades 220 being located in the cavity 120 and the rotary shaft 210 is located above the lower portion of the second cooling fins 131 (see Fig. 3) and the rotary shaft is positioned to be away from the fins 131.

Independent claim 19 includes a heat sink 100 including a plurality of first cooling fins 110 and a plurality of second cooling fins 130 with a cavity 120 defined therebetween with the second cooling fins including a lower portion 131. A centrifugal fan 200 includes a rotary shaft 210 and a plurality of blades 220 with the blades being located in cavity 120. There is a distance between the rotary shaft 210 and the fins 131 (see Fig. 3) so that the entire rotary shaft is located above the fins 131 and positioned away the fins. A cover 300 includes a plurality of inlets 310 disposed on the heat sink 100 and the fan 200 so that ambient air flows in the axial direction of the fan into the heat sinks and flows out in the radial direction of the fan.

Claim 24 is another independent claim which includes a heat sink 100 including a plurality of cooling fins 110 and 130, and a cavity 120 defined between the fins. A centrifugal fan includes a hub 230, rotary shaft 210 and a plurality of blades 220 located in cavity 120.

There is a distance between the rotary shaft 210 and lower portion of the cooling fins 131 so that the shaft is positioned away from the fins.

Claim 9 depends from claim 8 and further describes the cover 300 which is formed on the heat sink 100 and the centrifugal fan 200.

Claims 10, 15 and 20 depend from different independent claims but are otherwise similar and describe that the cover 300 includes an air seal (page 7, line 19 of the specification).

Claims 11, 16 and 21 depend from different independent claims but are otherwise similar and state that the cavity 120 matches the centrifugal fan 200.

Claims 12, 17 and 22 depend from different independent claims but are otherwise similar in describing that the cooling fins 130 are distributed under and around a region extending from a central region of the centrifugal fan 200 to a periphery of the centrifugal fan (this is seen in Fig. 2 (a)).

Claims 13, 18 and 23 depend from different independent claims but are otherwise similar and describe that the heat sink 100 is made of a material from the group of aluminum, aluminum alloy, copper, copper alloy and combinations thereof (page 7, lines 3 and 4 of the present specification).

VI. GROUNDS OF OBJECTION TO BE REVIEWED ON APPEAL

Claims 8, 10-14, 16-19 and 21-24 have been rejected under 35 USC 103 as being obvious over Budelman (U.S. Patent 6,244,331) in view of Hsieh (U.S. Patent 5,377,745). The Examiner merely states that Budelman shows the invention as claimed with the except of providing an entire rotary shaft located above the lower portion of the second cooling fins. The Examiner states that Hsieh shows an apparatus that does provide an entire rotary shaft located above the lower portion of the second cooling pins in Fig. 3. The Examiner feels it would have been

obvious to modify Budelman's invention by providing an entire rotary shaft located above the lower portion of the second cooling pins.

The Examiner separately rejected dependent claims 9, 15 and 20 under 35 USC 103 as being obvious over Budelman in view of Miyahara (U.S. Patent 5,940,268). Again, the Examiner states that Budelman shows the invention as claimed with the exception of providing a cover that serves as an air seal. The Examiner relies on Miyahara to show an apparatus that provides a cover that serves as an air seal in Fig. 4. The Examiner feels it would have been obvious to modify Budelman's invention by providing a cover.

Appellants question whether the Examiner meant to include claim 10 in the second rejection rather than the first rejection since the language of claim 10 is virtually identical to claims 15 and 20 and specifically describes the air seal, which is not discussed in the first rejection. Appellants request the Examiner's clarification of this point.

VII. ARGUMENTS

Adequacy of the Rejection

It is noted that the Examiner's entire description of the primary reference, Budelman, is only that it discloses the invention as claimed. Appellants submit that the Examiner has not met his burden of showing how the Budelman reference is applied to the various elements of the claims. Likewise, in regard to the Hsieh and Miyahara references, the Examiner only points out that the entire rotary shaft is located below the lower portion of the fins or that a cover serves as an air seal and then merely refers to a figure. Appellants submit that this is not an adequate description of the secondary references. It is further noted that the Examiner has not provided any motivation for utilizing the secondary references in conjunction with the primary reference.

For these reasons, Appellants submit that the Examiner has not met his burden of providing an adequate rejection.

Rejection of Claim 8

It is assumed that the Examiner is mostly relying on the embodiments shown in Figs. 4 and 5A of the Budelman reference. Based on this assumption, Appellants believe that the Budelman reference at least does not include the second cooling fins having a lower portion, there being a distance between the rotary shaft and the second cooling fins and that the rotary shaft is located away from the lower portions of the second cooling fins. Since Budelman shows a centrally mounted fan arrangement which specifically fits into space 418 (Col. 3, lines 34-39), it would not be possible for any of the second cooling fins to be placed below the motor.

The Examiner states that the Hsieh reference has a rotary shaft located above the lower portion of the second cooling pins in Fig. 3. Even assuming this is correct, there is no teaching in Hsieh that the rotary shaft is positioned away from the lower portion of the second cooling fins. The presence of the space in this area allows the air to circulate more easily and prevents overheating the central portion of the heat sink. Appellants submit that even the combination of Hsieh and Budelman do not teach all of the features. Furthermore, Appellants submit that there is no reason to utilize the fan arrangement such as shown in Hsieh in the Budelman device. Budelman clearly teaches that the fan should be mounted in a space in the middle of the fins. Providing a fan such as shown in Hsieh actually goes against the teachings of Budelman. There is no motivation for one skilled in the art to make a change from a bottom-mounted fan to a

suspended fan without some reason to do so. Accordingly, Appellants submit that claim 8 is not obvious over this combination of references.

Claim 14 shows a number of features included in claim 8, including the heat sink, the cavity between the first and second fins and the lower portion of the second fins. This claim also includes the fan with the rotary shaft and blades where the blades are located in the cavity and the shaft being located above the lower portion of the second cooling fins away from the fins. Appellants submit that the arguments presented above with regard to claim 8 likewise apply to these portions of claim 14 and that claim 14 is allowable for the same reasons recited above. In addition, claim 14 describes the cover connected to the heat sink having corners directly connected to the first cooling fins. Neither Budelman nor Hsieh show a cover. Appellants submit that claim 14 is additionally allowable since the references do not show this feature. It is further noted that while the Miyahara reference has been cited by the Examiner in regard to other claims to show a cover, it has not been applied against this claim. However, even if Miyahara was applied against this claim, it still would not show that the corners directly contacting the first cooling fins since in that reference the cover 19 is separated from the fins 12 which are in the lower compartment of the covering device. Accordingly, claim 14 would be allowable even if all three references were combined.

Claim 19 includes the heat sink with first and second cooling fins with the second cooling fins including a lower portion and a centrifugal fan having a rotary shaft and a plurality of blades with the blades being located in a cavity between the cooling fins and where there is a distance between the rotary shaft and the second cooling fins so that the rotary shaft is positioned above

and away from the lower portion of the second cooling fins. These limitations are also found in claim 8 and this claim is allowable for the same reason recited above in regard to claim 8. In addition, this claim recites the cover including a plurality of inlets so that air flows in the axial direction into the heat sink from the inlets of the cover and flows out in radial directions. As indicated in regard to claim 14, neither Budelman nor Hsieh show the cover at all. While Miyahara et al. shows a cover, the ambient air enters through opening 20 in a horizontal direction and is then drawn down through the center and exits out outlet 14. It is noted that the inlet and the outlet are not in the radial direction, but are instead in the horizontal direction. The inlet 20 is on the opposite side from outlet 14. The incoming air does pass from the upper chamber to the lower chamber in the axial direction. However, the claim discusses the movement of the ambient air in the axial direction. Once the air enters the opening 20, it is no longer ambient air and accordingly the movement from the upper chamber to the lower chamber does not meet the terms of the claim. Further, none of the movement of the air is in a radial direction. Accordingly, Appellants submit that claim 19 would not be obvious even over the three-way combination of references.

Claim 24 is the final independent claim and includes the heat sink for the plurality of fins and the cavity between the fins. The centrifugal fan includes a hub, a rotary shaft and a plurality of blades where the blades are in the cavity and there is a distance between the rotary shaft and the lower portion of the fins so that the rotary shaft is positioned away from the lower portion. As indicated in regard to claim 8, neither Budelman nor Hsieh teaches that the rotary shaft is positioned away from the lower portion of the heat sink. Accordingly, this claim is likewise allowable.

Claims 11, 16 and 21 describe the annular cavity as matching the centrifugal fan. These claims are considered to be allowable based on their dependency from allowable independent claims. In addition, it is noted that the Examiner has not pointed out where the references teach this feature. Accordingly, Appellants submit that the Examiner has not presented a proper rejection in regard to these claims.

Claims 12, 16 and 21 describe the distribution of the fins from a central region of the fan to a periphery of the fan. Appellants submit that these claims are allowable based on their dependency from allowable independent claims. In addition, the Examiner has not met his burden of explaining how the references show this feature. Accordingly, these claims are considered to be allowable.

Claims 13, 18 and 23 depend from allowable independent claims and as such are also considered to be allowable. In addition, the Examiner has not shown where the references teach the particular materials claimed. Accordingly, Appellants submit that the Examiner has not met his burden of showing a proper rejection in regard to these claims.

The Examiner rejected claims 9, 15, and 20 as being obvious over Budelman in view of Miyahara. It is assumed that the Examiner meant to include claim 10 in this rejection. Appellants' response is based on this understanding.

Appellants submit that these claims are not obvious over the combination of Budelman and Miyahara since these references do not show the feature of the entire rotary shaft being located above the lower portion of the second cooling fins. These dependent claims depend from

claims which have been rejected over Budelman in view of Hsieh with Hsieh being cited for this particular feature. Appellants submit that a proper rejection of these claims would have to include the Hsieh reference since these dependent claims incorporate the limitations of the independent claims from which they depend. This could only be avoided if the Miyahara reference also showed the feature shown by Hsieh. However, the Miyahara reference does not appear to show the lower portion of the fins with the rotary shaft being located above them. Accordingly, Appellants submit that this rejection is clearly improper.

Furthermore, Appellants submit that it is not clear that Miyahara et al. shows that the cover is airtight. Specifically, the Examiner has not pointed out where the reference shows this feature other than by merely referring to Fig. 4. Appellants submit that the Examiner has not provided a proper rejection in this regard.

It is noted that claim 9 only describes that the cover is formed on the heat sink and fan. However, Appellants submit that this claim remains allowable based on its dependency from claim 8 and a lack of teaching of the rotary shaft being positioned away from the lower portion of the fins.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

IX. EVIDENCE

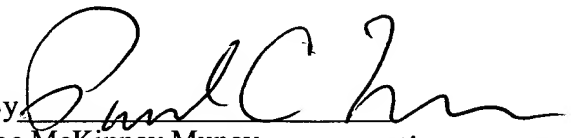
No Evidence is being submitted.

X. RELATED PROCEEDINGS

No related proceedings are referenced in II. above, or copies of decisions in related proceedings are not provided, hence no Appendix is included.

Respectfully submitted,

Dated: March 24, 2006

By 
For Joe McKinney Muncy
Registration No.: 32,334 #43,360
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant

APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/930,990

8. An embedded centrifugal cooling device, comprising:

a centrifugal fan including a rotary shaft and a plurality of blades; and

a heat sink, including a plurality of first cooling fins and a plurality of second cooling fins, wherein an annular cavity is defined between the first cooling fins and the second cooling fins, and the second cooling fins include a lower portion;

wherein the blades are located in the cavity, and there is a distance between the rotary shaft and the second cooling fins so that the entire rotary shaft is located above the lower portion of the second cooling fins, and the rotary shaft is positioned away from the lower portion of the second cooling fins.

9. The embedded centrifugal cooling device according to claim 8, further comprises a cover formed on said heat sink and said centrifugal fan.

10. The embedded centrifugal cooling device according to claim 8, wherein said cover serves an air seal to keep airtight.

11. The embedded centrifugal cooling device according to claim 8, wherein said annular cavity matches said centrifugal fan.

12. The embedded centrifugal cooling device according to claim 8, wherein said cooling fins are distributed under and around a region extending from a central region of said centrifugal fan to a periphery of said centrifugal fan.

13. The embedded centrifugal cooling device according to claim 8, wherein said heat sink is made of a material chosen from the group consisting of aluminum, aluminum alloy, copper, copper alloy and the combination thereof.

14. An embedded centrifugal cooling device, comprising: a heat sink, including a plurality of first cooling fins and a plurality of second cooling fins, wherein a cavity is defined between the first cooling fins and the second cooling fins, and the second cooling fins include a lower portion;

a cover connected to the heat sink and having corners directly contacted to the first cooling fins; and.

a centrifugal fan including a rotary shaft and a plurality of blades, wherein the blades are located in the cavity, the entire rotary shaft is located above the lower portion of the second cooling fins, and the rotary shaft is positioned toward the cover to be away from the lower portion of the second cooling fins.

15. The embedded centrifugal cooling device according to claim 14, wherein said cover serves as an air seal to keep airtight.

16. The embedded centrifugal cooling device according to claim 14, wherein said cavity matches said centrifugal fan.

17. The embedded centrifugal cooling device according to claim 14, wherein said cooling fins are distributed under and around a region extending form a central region of said centrifugal fan to a periphery of said centrifugal fan.

18. The embedded centrifugal cooling device according to claim 14, wherein said heat sink is made of a material chosen from the group consisting of aluminum, aluminum alloy, copper, copper alloy and the combination thereof.

19. An embedded centrifugal cooling device, comprising:

a heat sink, including a plurality of first cooling fins and a plurality of second cooling fins, wherein a cavity is defined between the first cooling fins and the second cooling fins, and the second cooling fins include a lower portion;

a centrifugal fan having an axial direction and radial directions and including a rotary shaft and a plurality of blades, wherein the blades are located in the cavity, and there is a distance between the rotary shaft and the second cooling fins so that the entire rotary shaft is located above the lower portion of the second cooling fins, and the rotary shaft is positioned away from the lower portion of the second cooling fins; and

a cover, including a plurality of inlets, disposed on said heat sink and said centrifugal fan, wherein air from ambient is flowed in the axial direction of the centrifugal fan into the heat sink

from the inlets of the cover, and is flowed in the radial directions of the centrifugal fan out of the heat sink.

20. The embedded centrifugal cooling device according to claim 19, wherein said cover serves as an air seal to keep airtight.

21. The embedded centrifugal cooling device according to claim 19, wherein said cavity matches said centrifugal fan.

22. The embedded centrifugal cooling device according to claim 19, wherein said cooling fins are distributed under and around a region extending from a central region of said centrifugal fan to a periphery of said centrifugal fan.

23. The embedded centrifugal cooling device according to claim 19, wherein said heat sink is made of a material chosen from the group consisting of aluminum, aluminum alloy, copper, copper alloy and the combination thereof.

24 An embedded centrifugal cooling device, comprising: a heat sink, including a plurality of cooling fins and a cavity defined between the cooling fins; and

a centrifugal fan including a hub, a rotary shaft and a plurality of blades located in the cavity, wherein there is a distance between the rotary shaft and the lower portion so that the rotary shaft is positioned away from a lower portion of the heat sink.